Space Weather Forecast

Issued on Monday, 10 June 2024 at 12:14 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate-class flares (R1-R2 radio blackouts) initially likely, slight chance of Strong flares (R3 blackout), risk declining through the period. Increase in solar radiation likely, slight chance of S3/Strong radiation storm. Slight chance of G1/Minor storms on Day 1 (10 June).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity is High with a Strong flare peaking at 10/1108 UTC, from the larger and more complex region on the southwest limb. This is the most active region, but it has nearly rotated off the southwest limb and is no longer clearly visible. It will contribute to the flare risk for another 24 hours or so until it is well away from the west limb. A further region in the southeast will be the largest region once the first region is off the disc. It consists of a large leader spot with smaller spots around it. The remaining regions are mostly simple and stable at the present time. Some looping observed in SDO imagery suggests a new region to rotate onto the southeast limb in the next 24 hours. No new Earth-bound CMEs were observed in the period.
Solar Wind / Geomagnetic Activity: Solar winds showed waning coronal hole fast wind influence. Wind speeds were initially slightly elevated, around 420 km/s, easing to background levels near 360 km/s. The IMF (Interplanetary Magnetic Field) was weak, with the north-south component varying weakly. Geomagnetic activity was Quiet (Kp 1 to 2).
Energetic Particles / Solar Radiation: Solar radiation levels have eased back below the S1/Minor radiation storm level.

Four-Day Space Weather Forecast Summary
Solar Activity: M-flares are initially considered to be likely with a slight chance of further Strong flares, mainly from the region on the southwest limb. The risk reduces through Day 2 (11 June) as this region rotates away from the west limb.
Solar Wind / Geomagnetic Activity: The CME which was modelled with a likely arrival time at Earth in the UTC morning of Day 1 (10 June) appears to have arrived at the STEREO-A spacecraft at 10/0300 UTC, which means it would have been expected to have arrived at Earth by now. As such, it is considered more likely that this has missed. No other new Earth directed CMEs have been seen in available coronagraph imagery. Solar winds have now eased to background levels after a coronal hole fast wind. A further slight fast wind enhancement is possible later on Day 4 (13 June).
Geomagnetic activity is likely to be mostly Quiet to Unsettled. Any enhancement associated with the 08 June CME is looking less likely now, but should it arrive then there is a risk of Active to G1/Minor Storm conditions on Day 1, perhaps lingering into Day 2 (10-11 June). There is also a chance of Unsettled to Active intervals on Day 4 with any weak fast wind influence.
Energetic Particles / Solar Radiation: Solar radiation is now below S1/Minor radiation storm levels after the recent S3/Strong enhancement. A further enhancement is likely after the recent Strong flare, with a slight chance of exceeding S3 again, before the risk reduces later in the period as the region on the southwest limb rotates away.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	50	30	30
Very Active	R3 to R5 X	Yes	20	15	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	60	50	30	10
Very Active	≥ S3 *	No	20	15	5	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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